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SCIENCE NEWS LETTER

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Ram Jet

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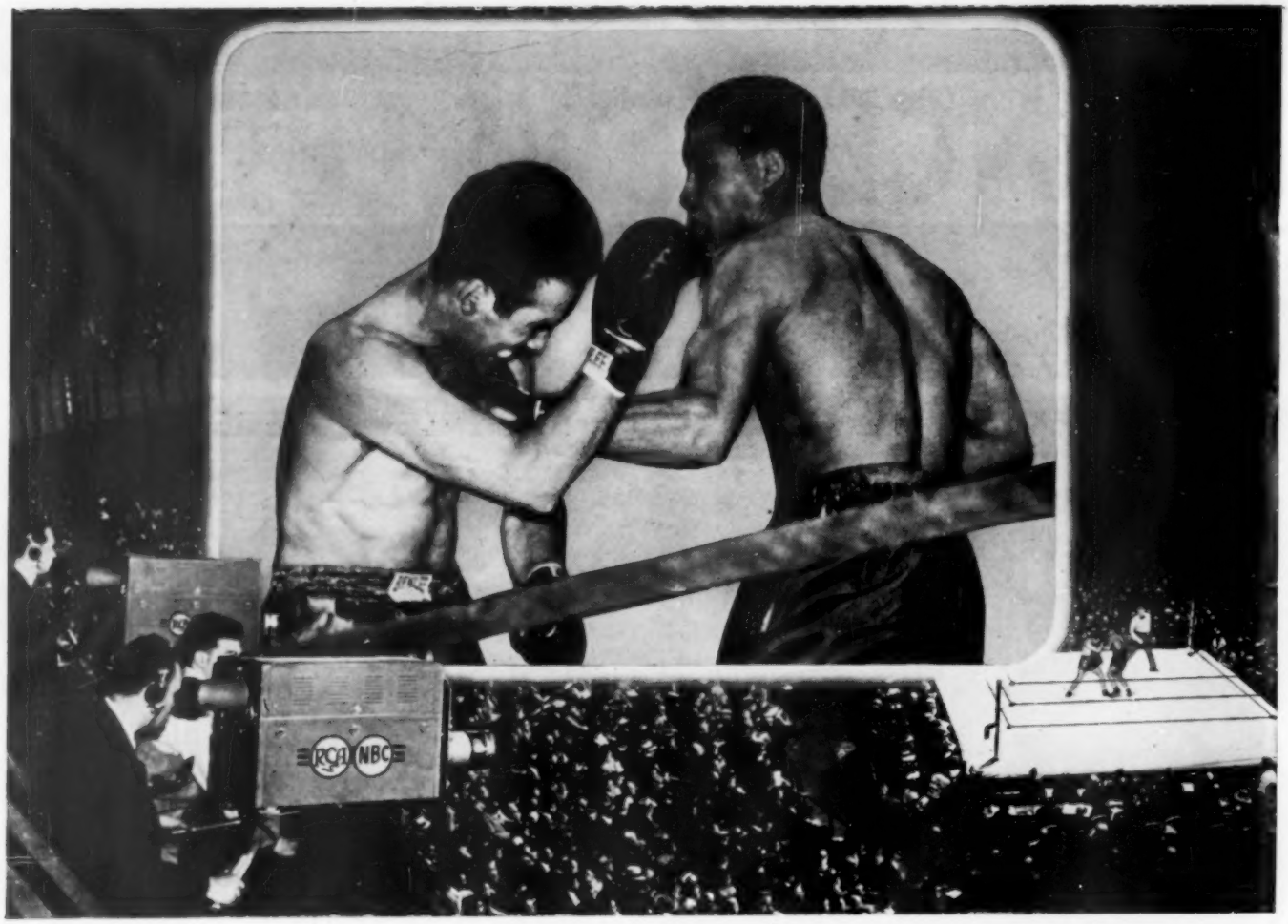

The big fight at the Yankee Stadium in New York in June will be televised by NBC.

In the ring with Louis and Conn—through Television

When challenger meets the champ, thousands of people who can't be at the ringside in person will watch the battle through television. For on that night The National Broadcasting Company will take them right into the ring for a *referee's-eye view* of every punch!

Every detail, every move will be picked up by NBC at the stadium with the RCA Image Orthicon camera —a camera that rivals the human eye in sensitivity and can see even by candlelight.

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AERONAUTICS

Ram Jet, Navy's Newest

This light-weight open pipe engine has just been revealed to the public. It may be used to power planes and weapons at 1500 miles per hour.

See Front Cover

➤ HURLING AIRPLANES or guided missiles through space at twice the speed of sound, a "flying stovepipe" that burns oxygen from the air as it flies may propel the high-speed aircraft of the future or power the weapons of another war.

Ram jet, as the light weight, open-pipe engine is called, was revealed to the public for the first time by Vice Adm. George F. Hussey, Jr., chief of the Navy's Bureau of Ordnance, and Dr. Richard Roberts, supervisor of the ram jet project at the Applied Physics Laboratory of Johns Hopkins University, Silver Spring, Md., who appeared as guests of Watson Davis, Director of Science Service, on Adventures in Science heard over the Columbia network.

With no moving parts and no precision machinery ram jet is essentially a pipe with a small opening at the front and open at the rear, Dr. Roberts said.

"Air is scooped in and compressed by its own speed; fuel is injected and burned; the exhaust streams out the rear providing a thrust like a rocket motor," he explained.

The impulse produced by the escaping hot gases shoots the 70-pound jet through the air at speeds between 800 and 1,500 miles per hour, but high speeds must be reached before ram jet can operate. Ram jets have to be launched and brought to high speeds by catapults or separate booster rockets to operate the "flying stovepipe."

Though ram jet was developed in the late stages of World War II to power guided missiles against such weapons as the German V-bombs and Japanese suicide planes, Admiral Hussey declared, "It is also possible that ram jets will be attached to the wings of planes to allow them to cruise at supersonic speeds."

Dr. Roberts said that conventional engines and propellers are still best for low speed flying, while a turbo-jet engine is more efficient as the speed increases. When the speed goes above that of sound waves, about 750 miles per hour, ram jet, with a "convenient cruising speed" of 1,500 miles per hour, is superior.

While the theory of ram jet propulsion was first expounded in 1913 by a Frenchman named Lorin, the preliminary work that led to successful experiments was started in the summer of 1944 by the Applied Physics Laboratory of Johns Hopkins University where the famous proximity fuze was developed during the war.

First actual tests of ram jet were made June 13, 1945, at Island Beach, New Jersey, and fishermen nearby joined the scientists as witnesses to the first flight of the new engine. More successful than counted on, the first tests sent jets out over the Atlantic Ocean, and one landed 50 feet from a fishing boat off the New Jersey coast.

As propulsion units for guided missiles, the ram jet has the advantages of being light and cheap. The first tests were made using the exhaust pipe of a Thunderbolt plane with the modified part developing more power as ram jet than could the plane.

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PHYSICS

Synthetic Oil Lubricates In Hot or Cold Weather

➤ SYNTHETIC SILICONE OILS, made by juggling molecules of sand, coal, oil and brine, lubricate effectively aircraft instruments at sub-zero temperatures, Westinghouse tests demonstrate. They also protect ball and needle bearings against corrosion in tropical climates.

These new oils perform well in changes from hot to cold weather conditions, as they will not evaporate in extreme heat and will flow freely in extreme cold.

In the tests temperatures were lowered to 85 degrees below zero Fahrenheit, and raised to the temperature of vapor from boiling water.

The silicones are American-developed synthetic resins made of sand and organic compounds. Both silicone oils and silicone greases are made, as well as many other products with many uses.

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FLYING STOVEPIPE—Successful working models of the Navy's revolutionary ram jet, a means of propulsion for flight at supersonic speeds up to 1500 miles per hour.

ASTRONOMY

New Molecular Bands On Jupiter and Venus

➤ HITHERTO UNKNOWN molecular bands of carbon dioxide around Venus, planet nearest to the earth, and of ammonia around Jupiter, largest of the planets, have been photographed at McDonald Observatory, Fort Davis, by use of a new infrared spectrograph.

Light of wave lengths of the order of one micron are photographed with the spectrograph, explained Dr. Otto Struve, director of the observatory owned by the University of Texas and operated jointly with the University of Chicago. This invisible form of infrared radiation is focused by means of a mirror and a grating plated with a thin coating of gold

Actual observations of the molecular bands were made at McDonald Observatory by two University of Chicago staff members, Prof. G. Herzberg, authority on the structure of molecules, and Dr. W. A. Hiltner, assistant director of the Yerkes and McDonald Observatories.

Studies with the infrared spectograph may disclose other information about the little-known atmosphere of neighboring planets. Researches at McDonald Observatory will be extended to still longer wave lengths of invisible light.

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ASTRONOMY

Bright New Comet

The comet which was spotted in the northeast sky by a Washington, D. C., business man has been named Pajdusakova-Rotbart.

➤A BRIGHT new comet was discovered in Washington, D. C., early Thursday morning, May 30, by an amateur astronomer, David Rotbart, a Washington business man. Looking through binoculars at 2 a.m., EST, Mr. Rotbart spotted the sixth magnitude comet in the constellation of Cygnus, the swan. Just bright enough to be seen with the naked eye, the tail was less than one degree and the comet had a nucleus.

Discovery of the comet was confirmed at the U. S. Naval Observatory early Friday morning, May 31. The comet was found to be moving quite rapidly toward the northwest.

Word of discovery of this comet by an observer in Europe had just been received at Harvard College Observatory, clearing house for astronomical information in America. A cablegram from Dr. Elis Stromberg at Copenhagen reported that it was located at 7:30 p.m., EST, Wednesday, May 29, by a European astronomer named Pajdusakova. The comet at that time was estimated to be about the eighth magnitude, too faint to be seen with the naked eye.

This new heavenly object will be called the Pajdusakova-Rotbart comet, the two men having discovered it independently. This is the first comet that Mr. Rotbart has reported. He has a wide-angle telescope and three pairs of binoculars he uses in his observations.

When found, the comet had a right ascension of 20 hours, 36.8 minutes, and a declination of 30 degrees, 4 minutes. Rough observations made twenty minutes apart at the Naval Observatory by Alfred Mikesell showed the comet moving westward about one hour per day and northward eight degrees daily.

Located in the constellation of Cygnus, the swan, the comet sped across the constellations of Lyra, Hercules and Bootes, the herdsman, toward the constellation of Coma Berenices, Berenice's hair. The rapid motion of the comet through the heavens may be accounted for by the fact that it is moving around the sun in the opposite direction from the earth, states Leland E. Cunningham of the University of California, who computed its orbit.

It was closest to the sun on May 11, when it made what astronomers call its perihelion passage. It was then about 95 trillion miles from the sun, just a little more than the average distance of the earth from the sun.

Bright enough to be picked up with binoculars when first spotted, the comet faded rapidly. The moon interfered with the comet during the week-end of June 9, and it will probably be too faint to be seen with small telescopes after full moon, June 14.

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***NEWEST COMET**—Comet Pajdusakova-Rotbart as it appeared in the northeastern sky on June 4, photographed at the U. S. Naval Observatory, Washington, D. C., with their 10-inch photographic equatorial telescope. The star trails are "wiggly" because of guiding done on the comet during exposure.*

Wood on land is attacked by decay-producing fungi and such insects as termites, and wood under water by the marine wood-boring teredo and other forms of life that seek shelter or food.

ORNITHOLOGY

Sparrows and Starlings Build Duplex Nest

➤ HERE'S A story of housing shortage in the bird world. Birds do share duplex apartments. A pair of English sparrows and a pair of starlings built their nests together like a double house, each having its own side, Lewis E. Potts reports to the American Museum of Natural History.

The birds fought continuously while building their nests. After a month of squabbles, peaceful neighborliness reigned.

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COMET - DISCOVERER — David Rotbart is shown in his home observatory. The binoculars he is holding are the ones with which he spotted the new comet, which will bear his name along with that of its co-discoverer, Pajdusakova, a European astronomer, who cited it on May 29.

GENERAL SCIENCE

Seven Blind Spots Still Unsolved by Scientists

➤ SEVEN SECRETS or mysteries, major unknowns that need scientific attention and exploration to conquer, were pointed out at the Southwest Chemurgic Conference by Watson Davis, director of Science Service, Washington, D. C.

The conquest of some of these blind spots may not come for years or decades, he said. The acceleration of science's achievements may bring some in a relatively short time.

First is the secret of photosynthesis. This is the greatest unknown. It is what the green leaves do when they capture the energy of the sun and store it in the form of food.

Second is the secret of life, and third, the secret of the universe, and then the secret of the chemical elements. The other three Mr. Davis called mysteries. They are the mystery of disease, the mystery of mind and emotions, and the mystery of war. "War is a major problem worthy immediately of our best research," he added.

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AERONAUTICS

Rainmaker Aids Landings

➤ A RAIN-MAKING machine now under construction may solve the problem of clearing fog-bound landing fields and prevent many of the fatal air crashes now caused by "ceiling zero" visibility at airports.

The rainmaker sends out sound waves that drive the fog particles together, forming rain drops. The rain falls, clearing the air field. This attack on the fog problem proved effective in tests during the war at the Navy's Landing Aids Experiment Station at Arcata, Calif., where sirens were used to blast the fog, but the new machine may do a more subtle job.

Sirens not only turned the fog to rain but also made personnel on the field sick and knocked birds out of the sky, so the new machine will be able to generate sounds of such high frequency that they cannot be heard by human or animal ears.

The rainmaker, being built by Ultrasonic Corporation, is a high-powered sound generator equipped with a wide frequency range for experiments to determine how much sound of what frequency will do the best job clearing different types of fog.

The Navy's Office of Research and Invention expects to spend $100,000 for the construction and experiments with the rain machine that is scheduled to be tested at Arcata, where the Army, Navy and civilian air groups now test all-weather landing aids. The Navy hopes to try out the instrument in September at Arcata before the fog season there ends.

An air jet-type, acoustic generator, the rainmaker will be about eight feet in diameter with a parabolic reflector. An earlier model gave good results in the laboratory, but lacked the controlled frequency range of the new machine.

Tests to be made at Arcata with the acoustic generator include experiments with the effects of sound waves on the structure of airplanes and on personnel in planes.

Most successful wartime fog dispersal systems, the famous FIDO (fog, intensive dispersal of), used controlled fires along the runways to clear the fog over landing strips. The greatest disadvantage of these units, the high fuel cost per landing, is being overcome by a new thermal installation nearing the test stage at Arcata, but the Navy is looking to the possibility of sound replacing heat in the fight against fog.

Even if the sonic system does not prove practical for airports, officials of the Office of Research and Invention declare that new and important information about sounds and their uses will be gained from the rainmaker.

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SURGERY

Removing Brain Tumor Restores Sight

➤ AN UNUSUAL case of recovery from blindness that had lasted six months is reported by Dr. J. Grafton Love and Dr. C. Wilbur Rucker of the Mayo Clinic. The recovery was due to removal of a brain tumor that "interrupted" the left nerve of sight and practically all the nasal fibers of the right one.

On the morning of the operation the patient was totally blind in the left eye and could not see enough with his right eye to count fingers held 12 inches from his eye. Two weeks later examination showed "excellent improvement and return of vision in the nasal portion of the field of the left eye." Improvement of eyesight also occurred in the less seriously affected right eye.

Within three months after the operation the patient was back at his work as repair foreman in a railway yard, a job he had had to quit six months before the operation because of the blindness, which had been coming on for a year.

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NUTRITION

Baby Food to Be Kept In Freezer, Not a Can

➤ BABIES WILL eat frozen foods in the near future. Dr. Leonora Hohl, food technologist on the Berkeley campus of the University of California, says that frozen foods are better for babies than some types of canned foods.

The frozen foods retain a large percentage of the vitamins over long periods. They have more eye-appeal and are more palatable in many cases. Only what is wanted for a serving need be thawed at one time.

Hospitals and other large institutions will be the first large users of frozen baby foods, Dr. Hohl predicts.

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ELECTRONICS

Magnetic Detector

Used during the war to locate Nazi U-boats, these detectors will now be used in locating oil, and for other geological surveys.

➤ AIRBORNE MAGNETIC detectors, that helped locate German submarines under water, will be found usable, it is expected, in locating oil in depths below the surfaces of the continental shelves surrounding America which were recently claimed by the President and put under federal jurisdiction.

These magnetic detectors were installed on the wing of an airplane or on the forward part of the belly of a blimp. They reacted to the magnetic metal in a submarine below. The magnetic reaction activated a needle on the instrument board, notifying the crew of the presence of an underwater boat. Then by circling and following the needle's directions, the pilot was able to determine the exact position of the enemy boat.

In geological work, these airborne magnetic detectors would be employed in much the same way as ground-based precision instruments are now used in making so-called magnetic geological surveys. In a recent magnetic survey of Florida by the U. S. Bureau of Mines results were obtained that indicated areas favorable for the occurrence of petroleum.

Essentially, a magnetic survey is a method of determining the contours of underlying granites and other formations —known to geophysicists as the "crystalline basement." A knowledge of the crystalline basement, particularly in areas covered by marine sediments, is of fundamental importance in oil exploratory work, according to Dr. R. R. Sayers, Director of the Bureau.

The invention and development of the wartime magnetic airborne detector has been officially a secret until information was released by Dr. George B. Pegram of Columbia University. Some of the development work was done by the university's Division of War Research, under a project of the U. S. Office of Scientific Research and Development.

Magnetic detectors were developed also by the Naval Ordnance Laboratory, and the Bell Telephone Laboratories; and by the Gulf Oil Corporation working independently and later under contract with the National Defense Research Committee. Gulf research laboratories began work on a "flying eye" in 1940, and made a successful flight test in 1941.

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MAGIC EYE—Here we see the magnetic detector being flown from the wing of a plane as it will be used to locate oil below the surface of the continental shelves.

RADIO

"Hams" Reach New High In Radio Frequency

➤ RADIO communication in the ultra-high frequency field at 21,900 megacycles, a new record high for amateurs, has been completed by two "ham" operators.

Dr. A. Harry Sharbaugh, Jr., and Robert L. Watters, both scientists in the General Electric Research Laboratory, communicated across 800 feet, using the ultra-high frequency waves approaching the length of the longer light waves. Radio waves at such high frequency behave more like light waves than conventional radio waves, the operators reported.

First amateur invasion into the super-high frequencies of wartime radar was reported a few months ago at 5,300 megacycles when the Federal Communications Commission first assigned these bands to amateur radio operators.

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FOOD TECHNOLOGY

Thin-Sliced Potatoes Dried While Frozen

➤ CALIFORNIA may have sun-dried raisins and prunes; Alaska offers something new—and not under the sun, either, for it is done best in the long, frigid dark of the subarctic winter nights. It is a process for cold-drying potatoes, worked out by Dr. Basil M. Bensin, agronomist at the Alaska Agricultural Experiment Station.

Dr. Bensin's process consists in slicing raw potatoes very thin—from one-sixteenth to one-eighth inch—spreading the slices on a wire-netting frame, and setting them outdoors in the cold air for from 50 to 60 hours. They freeze immediately, but lose water even while they are frozen. It is not evaporation, strictly speaking; such loss of water from the frozen state is technically known as sublimation. In Dr. Bensin's experiments potato slices lost more than 60% of their water content. Their vitamin content remained unchanged, he states.

The potato slices darken on exposure to the air, as all potatoes do. This is a result of a simple enzyme reaction, and does not affect their food value. The original white color can be restored by bleaching with sulfur dioxide, a standard method long in use for bleaching dried fruits and vegetables.

Dr. Bensin believes his process can be applied also to other Alaska-grown vegetables, like carrots, beets and parsnips. The frost-dried products, compact and light-weight, should be useful additions to the food supplies of prospectors, miners, trappers and other men who have to watch the weight of their field rations.

A frozen-dehydration process has been used in the preparation of dried blood plasma and serums and in the crystallization of penicillin. A similar process has also been patented for the preparation of dehydrated foods without heating them, and is expected to be in commercial production within a few months. But these processes require elaborate and expensive refrigeration machinery, and often vacuum pumps as well. All Dr. Bensin needs is a sharp knife, some wire netting and wood—and the Alaska winter.

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Among the *deaths* during 1944 in the United States, there were 1,225 of persons reported to be 100 years old or over.

AVIATION

Flying Records Announced

The Army Air Forces have established new world records with standard production-line airplanes, including the new jet fighter and the helicopter.

➤ NEW WORLD aviation records have been established by the Army Air Forces. They were made by standard, currently operational, production-line aircraft stripped only of armament. Some of the records were established at Wright Field, Ohio, others in load-altitude tests, with B-29 aircraft at Guam.

On April 19, a Lockheed Shooting Star, the P-80, made a record of 495 miles per hour over a 62-mile low-level run from Wright Field to Jeffersonville, Ohio, and return, losing much time in slowing down to make the turn at its half-way point. This beat the existing record by over 100 miles an hour.

A month later a P-80 flew a 1,000 kilometer (approximately 621 miles) course and a 2,000 kilometer course at an average speed of 440 miles an hour. The previous record was 325 miles an hour. The 2,000-kilometer trip was made at 35,000-foot altitude, and over half the way had inclement weather which made it necessary to fly on instruments "talked around" by radar operators who followed the plane on their radar screens.

This 440-mile record over the 621-mile turn-around course was shattered on June 3 by a Shooting Star which flew the same route at an average speed of 462 miles an hour.

Six records were broken on May 17 by the famous Boeing B-29. They are:

Speed over a 1,000 kilometer course with 1,000 kilogram (2,205 pounds) payload, 369 miles per hour; previous record 326 mph.

Speed over a 2,000 kilometer course with 1,000 kilogram payload, 366 mph; previous record, 311 mph.

Over 2,000 kilometer course with 2,000 kilogram payload, the same as the above with the same previous record.

Over a 2,000 kilometer course with 5,000 kilogram payload, 366 mph, bettering the earlier record of 251 mph.

Over a 1,000 kilometer course with a 5,000 kilogram payload, 369 mph. 110 miles more than the standing record.

Over a 1,000 kilometer route with 2,000 kilograms of load, 369 mph, as compared with a previous 321 miles per hour.

On the same day another B-29 covered a 1,000 kilometer course with a payload of 10,000 kilograms averaging 358 miles per hour, and a 2,000 kilometer course with the same load at an average speed of 356 miles an hour. Previous records were 207 and 205 miles per hour respectively.

A helicopter duration performance was broken on May 13 when a Sikorsky R-5 remained in the air nine hours, 33 minutes and 27 seconds. The earlier record was one hour and 32 minutes.

On May 22, an R-5 helicopter made a non-stop flight from Wright Field to Boston in 10 hours and three minutes. It is a record for helicopter distance. On June 3, a Sikorsky-5A made a new international speed record of 110.5 miles an hour, the previous world record being slightly over 76 miles.

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Oregon ash belongs to the olive family; besides the edible olive, this family includes the lilacs, forsythias, and the privets.

HERPETOLOGY

Snake Buried in Sand Is New Desert Danger

➤ RATTLESNAKES buried in the sand offer a new hazard in the desert. A sidewinder, which is a rattlesnake that does not coil like others of its breed, but before striking makes a figure S with its head, was caught in the act of submerging itself beneath the California desert sand by Dr. Raymond B. Cowles of the University of California at Los Angeles.

"When bedding down, the sidewinder forms a tight coil or pad," Dr. Cowles states, "and then proceeds to edge or nudge the sand outward from beneath its body. It thus forms a saucer-shaped depression in which it lies with the back of its body flush with the surrounding surface."

While some snakes may wiggle down into the sand, others may become covered by wind-blown sand. Sidewinders, mostly active at night, usually bury themselves in sand during the daytime or come to rest on the shady side of a tree or bush.

North African vipers, Old World counterparts of the California desert sidewinder, are known to bury themselves in the sand. But in 15 to 20 years of collecting snakes and lizards, Dr. Cowles remained skeptical about the sidewinder until he actually saw one so buried.

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RECORD BREAKER—The Republic Thunderjet, new XP-84 jet fighter, has just been revealed by the army. Its speed is more than 590 miles per hour, and it has a service range of 1,000 miles and ceiling above 40,000 feet.

MEDICINE

Too Little Protein Does Not Cause Dropsy

➤ FAMINE SUFFERERS get dropsy but, contrary to general scientific belief, it is not because they have had too little meat and other protein foods.

Evidence for this new view, which upsets the almost universally held theory developed after World War I, was obtained from 34 men, volunteers from civilian public service, who lived on a European type of famine diet for six months. The new findings are reported by Drs. Ancel Keys, Henry Longstreet Taylor, Olaf Mickelsen and Austin Henschel, of the University of Minnesota, in the journal, *Science* (May 31).

In spite of the low amount of protein furnished by their diet of whole cereals, potatoes, turnips and so on, the concentration of protein in the blood plasma of the volunteers fell only slightly and the ratio between two kinds of protein, albumin and globulin, in their plasma remained within normal limits.

The men lost a quarter of their body weight and they did develop dropsy. Their clinical state closely resembled that seen in Europe in 1945. They showed no signs of kidney or heart failure. Reports from studies of European famine sufferers, Dr. Keys and associates say, bear out their finding that famine edema or dropsy is not simply a result of too little protein in the blood or of kidney or heart failure.

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PSYCHIATRY

Man-Created Moon and The Atomic Bomb

➤ THE ASTRONOMICAL possibility of creating and putting into operation a second moon of the earth was suggested to the American Psychiatric Association by Dr. Harlow Shapley, director of Harvard College Observatory.

Given enough money and time, Dr. Shapley said, man could fashion a tiny object, radio equipped and jet controlled, which could be sent the proper number of thousand miles aloft and then caused to travel gravitationally at the same speed as the earth's surface beneath so that it would seem to stand still at one spot over the earth's equator.

This stunt would have no real useful purpose, but it would be no more crazy to do this than many other things that are being done, Dr. Shapley told the psychiatrists.

Among the "miscellaneous lunacies of the higher terrestrial animals" cited by Dr. Shapley were the making of atomic bombs as instruments of foreign policy and the holding of expensive atomic bomb demonstrations while millions of Europeans and Asiatics starve.

Any connection between human lunacy and the moon is wholly superstition, Dr. Shapley reassured the experts on mental troubles, except for "possible subjective effects upon susceptible patients who, hearing that full moonlight promotes silliness, become silly."

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NUTRITION

High Protein Diet Prevents Dog Hysteria

➤ TO PREVENT your dog from having running fits, or canine hysteria, be sure he has a sufficient supply of high quality protein.

This is the advice of Dr. Agnes Fay Morgan, noted University of California nutritionist, who has studied running fits in dogs for several years.

Dr. Morgan says that laboratory experiments show that running fits can be prevented by dietary means. Some experts have contended that canine hysteria is a matter of heredity, while others have failed to prevent the ailment by the administration of high concentrations of vitamin B content.

Dr. Morgan and Mary Groody, researcher, fed dogs on a diet consisting of nothing but a commercial dog food containing wheat flour, wheat germ, bone meal and salt, meat meal, soy bean, and special vitamin supplements. This diet produced fits in nearly all dogs tested after periods ranging up to 19 days. The dogs also lost weight and were nervous.

The running fits ceased after a few days during which fresh ground beef lungs, meat scraps, and fish were fed to the animals.

Dr. Morgan and Mrs. Groody concluded that this indicated the protein content of the dog food was not high enough in quantity or quality.

The commercial producers added fresh ground beef lungs, meat scraps and ground fresh fish to their dog food; this formula was tested by Dr. Morgan and Mrs. Groody, with the result that dogs did not contract running fits, even after more than two months feeding.

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IN SCIENCE

ASTROPHYSICS

Put More Windows on the South Side of the House

➤ MANY HOME owners would be interested to find out what the sun can do by way of competing with coal.

A modern house with 100 square feet of south-facing window area can soak up in one winter season enough heat to save a ton of high-grade anthracite, Irving F. Hand of the U. S. Weather Bureau told his fellow-scientists at the meeting of the American Meteorological Society. He made his calculations at the Blue Hill Observatory of Harvard University, where he is stationed. Houses farther south can make the coal-pile last a little longer with solar assistance, he added.

It is better to put windows on the south face of your house than on the east, Mr. Hand state: south windows are much more efficient sun-traps, and east windows are difficult to shade in summer.

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AERONAUTICS

New Army Jet Fighter Has Greater Speed and Range

➤ THE NEWEST ARMY jet fighting plane, designed and constructed by Republic Aviation Corporation, has been thoroughly tested and a hundred or more will be built during the coming year. It is about the size of the Lockheed P-80, but somewhat heavier, and is claimed to have all the better characteristics of a great fighter plane.

Information concerning the new plane was revealed at Wright Field, Ohio, to a group of aviators and scientists. It has a speed of more than 590 miles an hour, a service range of 1,000 miles, and a service ceiling of over 40,000 feet.

The XP-84 Thunderjet, as the plane will be called, is powered with a General Electric jet engine. Its air-scoop is located in the nose of the plane rather than on the sides, the customary place. It has an electrically operated removable canopy over the pilot which can be quickly opened at all air speeds to permit an emergency exit.

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NCE FIELDS

MEDICINE

Vitamin D May Help Fight Tuberculosis

➤ VITAMIN D, the anti-rickets vitamin, may lead to a new chemical attack on tuberculosis and other germ diseases, it appears from studies reported by Dr. Walter Raab, of Glenn Dale, Md., Sanatorium, in the journal, *Science* (May 31).

Injection of a concentrate of vitamins A and D into the membrane surrounding the lungs in tuberculous empyema resulted in disappearance of the germs, he reports.

Large doses of vitamin D injected into guinea pigs suppressed tuberculosis in these animals.

The anti-germ action of vitamin D is not related to its anti-rickets action, Dr. Raab found. Ergosterol, parent chemical of the vitamin, which has no rickets-preventing power, also stopped the growth, in test tube experiments, of tuberculosis germs and another organism, staphylococcus aureus. So did cholesterol, a related chemical. These substances are related through phenanthrene, which includes in its chemical relatives sex hormones, bile salts, certain heart disease remedies and morphine.

Science News Letter, June 15, 1946

RADIO

New York-Moscow Radio Messages Relayed

➤ THE WORLD'S worst magnetic storm area, which lies on the direct air route from New York to Moscow, is by-passed by radio messages using a new automatic radio relay station in North Africa opposite Gibraltar.

The new relay, now successfully tested, is in the International Zone at Tangier. A radio message between the two cities will travel 1,300 miles farther by way of Africa than over the direct route, but the difference in time required is negligible, and it will pass far south of the magnetic storm region. The station will provide uninterrupted radio communication between the United States and the Soviet Union.

The direct airwave route from New York to Moscow passes west of Newfoundland, just south of Greenland, over the southern tip of Iceland, and across central Norway and Sweden. It passes so close to the North Auroral Zone, or magnetic storm area, that shortwave radio signals fail to get through when sun-generated storms occur.

The African relay station was constructed by the Radio Corporation of America. Henry E. Hallborg of the company, an authority on geomagnetism, explains the need of this alternate route.

"One of the worst trouble areas," he says, "is the North Auroral Zone, a ring 60 miles above the earth's surface around the North Magnetic Pole. It is approximately 700 miles wide and is caused by radiation from the sun attracted to the pole. During normal conditions of the ionosphere, radio signals pass through it, but when sun spots appear, the width of the ring may spread to as much as 2,800 miles in diameter. At such times, the ring becomes turbulent and overlaps the direct path between New York and Moscow."

Science News Letter, June 15, 1946

AVIATION

Airport Traffic Control System Demonstrated

➤ THE MOST effective military airport traffic control yet developed was demonstrated to the national press conference, at Clinton County Army Airfield, Wilmington, Ohio.

Nine giant planes landed, one closely following the other, each directed by radio orders from a control station.

It is a radar-radio system, the CPN-18 (XW-1), designed to survey by radar an area 40 miles in radius, identifying each plane and feeding it into a landing approach system such as GCA (Ground Control Approach) or SCS-51 (Localizer Glide Path).

Basically the CPN-18 unit operates on the war-developed radar principle. The unit's transmitting station sends out a rotating search beam of radar pulses which scans the surrounding area. The beam picks up every plane in the area and makes them visible to operators on radar scopes. The operators then direct the approaching planes for position and landing by radio. With this system, the station has identified and channeled aircraft into the approach at the rate of 40 planes per hour, even under conditions of low ceiling and poor visibility.

Science News Letter, June 15, 1946

ARCHAEOLOGY

Ancient Cities Died When Rivers Changed Course

➤ ANCIENT CITIES along the Tigris and Euphrates rivers, or canals connected with them, became doomed when these rivers changed their courses, withdrawing the cities' lifeblood. No harder blow could have been dealt to a city than to be deserted by the river upon which it depended for trade and agriculture.

The ruins of many cities in this region today are inaccessible. Far too many of them, after flourishing for several centuries, were completely abandoned. Changes in the rivers' course are largely responsible, Dorothy Mackay states in *Antiquity*, British quarterly review of archaeology.

Man's original settlements, when he gave up nomadic life, were undoubtedly built on the banks of rivers and streams. He not only needed water to slake his thirst, but had to have it in quantitity to water his fields.

Examination of many sites far from the nearest river suggests they were once on river banks, Miss Mackay found. Sometimes a band of silt deposited by a river or remains of a canal bank can be found, showing that water once flowed by that region. Boats sketched on a seal or bit of pottery show the ancient residents' familiarity with transportation by water. River beds themselves can often be traced because soil beneath where a river once flowed differs in color, texture and composition from the surrounding alluvial soil.

Science News Letter, June 15, 1946

PHOTOGRAPHY

Shutterless Camera For Aerial Mapping

➤ A CAMERA for use in aerial mapping, designed to do away with the necessity for subsequent piecing of photographs together into a mosaic, is the invention on which Russell R. Vought of Beverly Hills, Calif., was awarded patent 2,401,530. Instead of exposing whole areas of film at intervals this camera exposes a very narrow strip through a slit. The long roll of film is kept moving slowly past this slit, at speeds varying with the speed of the plane. Thus a continuous record is made of the terrain over which the plane is flying.

Science News Letter, June 15, 1946

RADIO

Television from the Skies

Ultra-short waves follow straight paths, reaching out from 30 to 50 miles. So television is taking to the air to make longer ranges possible.

By A. C. MONAHAN

➤ TELEVISION IMAGES ride on short waves that act very differently from the longer ones used in the ordinary radio broadcast, or in inter-continental signals. The result is, television is local, while radio broadcasting is world-wide.

With your radio set you can pick up music or talks transmitted from far-distant stations in Havana, Buenos Aires, London, Moscow—practically anywhere on the earth. With your television receiving set, however, you can usually pick up pictures from a television station not more than 30 to 50 miles away.

This is because the relatively short television waves travel in straight lines through unobstructed paths. Ground waves of long-wave broadcasting follow the curvature of the earth for several hundred miles until their intensity becomes too weak for reception. Sky waves from a radio station go upward at an angle, and are reflected back to earth by the outer layer of atmosphere that is electrically charged. It is these that make it possible to receive broadcasts thousands of miles away.

Waves Don't Bounce Back

The very short waves that carry television images, on the other hand, do not bounce back from the "radio roof." They act like beams of light, travelling in straight lines. The practical result is that they can reach just about as far as you can see from the top of the sending tower. That is not apt to be more than 50 miles, and is usually nearer 30. This is called the "line-of-sight" distance, and the horizon is referred to as the usual limit of television reception.

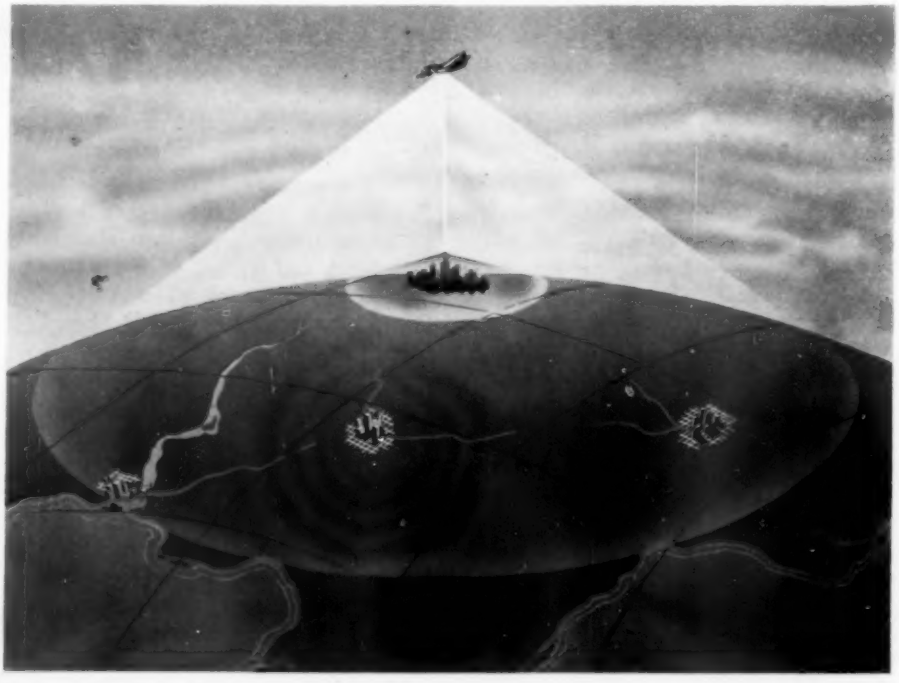
The higher the transmitting antenna is above the level earth, the farther away is the horizon, and the greater is the area of reception. For this reason, television broadcasting stations are erected on high towers on as high elevations as possible. But even then, their programs can be picked up by receivers in ordinary homes only within a circle of 30 to 50 miles in radius.

The length of a wave dissipated into space by the antenna of a transmitting system is the distance a single wave travels while it is being formed. This depends upon the time required to generate a single wave, which in turn depends upon the frequency of the energizing circuit in the transmitter; that is, the number of electrical cycles or vibrations per second.

Mountain Peaks Help

An exception is the new television transmission station erected atop Mt. Wilson, about 20 miles from Hollywood, Calif., at an elevation of 6,000 feet. Because of surrounding lower terrain, it is thought the reception area will be 100 miles in radius, and that this single station will serve all of the southern California coastal area. Stations erected on other high isolated peaks may also be able to serve larger areas.

Television broadcasting, including the



TAKING TO THE AIR—Television broadcasts beamed from airplanes flying six miles up in the air can supply programs to people living within a radius of 200 miles.

cameras and equipment to give action-talking events as they occur, is costly. Large audiences must be served if programs are to be financially feasible. The population within a 30 to 50 mile radius is not ordinarily enough. The program from a single originating station must be spread over a much greater area. How to carry the talking pictures to sufficiently large areas is one of the great problems of the television industry.

Systems of Pickup

A system of relay stations seems to be the answer. One plan under trial includes ground-based radio relays on towers that will pick up programs from the air and rebroadcast them. Another system uses relays fed by coaxial cable from originating transmitters. A third proposes airborne relays carried aloft either by planes or blimps. Probably all three will be used eventually.

At least two ground-based radio relay systems for airborne television waves are under construction. One is between New York and Boston; the other between Chicago and Milwaukee. In the first of these installations the relays will be from 30 to 40 miles apart, making eight jumps between the two cities.

To help carry the radio waves from one relay to the next, large lenses will be used. They are metal lenses that can focus the radio waves in much the same way that a glass lens focuses light. In appearance, however, they bear no resemblance to the familiar optical lens.

Each is an array of metal plates placed somewhat like the cross slats on a window blind, but designed to focus the radio waves as effectively as a solid lens might focus them if due regard is given to the fact that the edge of the wavefront is advanced, rather than retarded, in transit.

Cables Are Expensive

Television images can be transmitted short distances by special telephone wires, but not far because the electrical losses are too great. They can be transmitted almost unlimited distances by coaxial cable, however, but coaxial cable is expensive to manufacture, install and maintain. When used part time for telephone communication and part time for television, its use is economically feasible.

A coaxial cable is a lead-covered flexible tube containing, usually, from six to eight conductors. Each conductor is a copper tube about the size of a lead pencil, with a heavy copper wire extending throughout its length and held by plastic disks in its center, out of contact with the tube. Each tube can accommodate a television channel or 480 telephone channels.

To cover the United States with enough coaxial cable to connect all the principal cities would cost an enormous sum. It is estimated that a single coaxial cable across the country, without the repeater stations, would cost $100,000,000 and take five years to complete. It would still be only an East-West link, and would provide only a few feeders for North-South zones.

Stations in the Air

The plan of carrying television relay stations high in the air by planes or blimps is ingenious but promising, and is a natural development for air-minded America. In some ways the airplane plan has advantages over the blimp plan. The planes can ascend to higher levels, and consequently can give television coverage to a greater area. The relative merits of the two have not yet been determined.

In the plan using airplanes, now under experimental development, giant planes of the heavy bomber or cargo type may be used. They will travel in lazy circles five miles or more above the earth, receive programs from ground-based stations and rebroadcast them.

It is estimated that a plane in the stratosphere 30,000 feet above the earth

Do You Know?

When *lawns* are sprayed with the 2, 4-D weed killer to destroy dandelions and plantains, it may be expected that the growth of the grass will be checked somewhat by the spraying; the check is usually only temporary, however.

Rat control requires continual attention; rats begin to breed at three or four months of age, the gestation period is about 23 days, the average litter is probably ten, and one female may have from six to ten litters a year.

An instrument for *remote measurement* of humidity at room temperatures, developed by the Army, uses two fine wire thermocouples, one of which is continuously wetted by a wick.

In the Dominican Republic, where much *coffee* is raised and used, it is considered bad luck to drink coffee while standing.

Abundant quantities of *helium*, the lightweight, noninflammable balloon gas, are now available for industrial and medical applications.

Liquid soap can be made from surplus Napalm, a gasoline thickener used in flamethrower fuel, by a process developed by the Army.

would send out short waves that would blanket the earth's surface like a giant inverted ice-cream cone covering an area over 400 miles in diameter. This is an area equal to the combined areas of New York, Pennsylvania and New Jersey.

Can Also Relay Programs

The system proposes airborne transmitters and relays. The same aircraft which broadcasts programs will serve to relay these programs to other transmitting planes. Cruising about at 30,000 feet above the earth, seven planes can provide complete New York-Los Angeles broadcasting and relaying coverage. Eight additional planes would provide coverage for nearly four-fifths of the country's population.

Relaying between the aircraft is relatively simple since the line-of-sight distance at 30,000 feet is over 400 miles. Moreover, the high altitude minimizes the effects of ground interference which troubles ground transmission.

Proposed system of airborne relays to rebroadcast programs received from ground stations must not be confused with the system, already successfully demonstrated, of airborne cameras and television equipment that take and transmit action pictures, with sound, of events as they occur on the earth below. The television images may be picked up by television receivers within range, or by relay stations for transmission and rebroadcast. With this equipment, a military staff 200 miles from the fighting front could view the battle as it progresses.

Science News Letter, June 15, 1946

ENGINEERING

Nuclear Energy for Ship Propulsion

➤ AN ATOMIC powered warship could travel a million miles, (back and forth across the Atlantic 160 times) on one fuel charge, Harry A. Winne, General Electric Company vice-president, declares.

Ship propulsion is likely to be the first practical power application of nuclear energy, he explained.

Since atomic power for marine propulsion could be used more freely than oil so far as weight is concerned, Mr. Winne foresees important increases in the power and speed of any class of merchant or fighting vessel.

Science News Letter, June 15, 1946

ALIKE AS TWO PINS?

Yes, or alike as two telephone handsets made by the same process. Yet, pins or handsets—no two could ever be made exactly alike. Dimensions, weight, performance—all vary every time due to variables in manufacture. How can these variables be *controlled?*

Back in 1924, Bell Laboratories' mathematicians and engineers teamed up to find out, forming the first group of quality-control specialists in history. They invented the now familiar Quality Control Chart, designed inspection tables for scientific sampling. They discovered that test data mathematically charted in the light of probability theory were talking a language that could be read for the benefit of all industry.

Western Electric, manufacturing branch of the Bell System, applied the new science to its large-scale production. In war, it was used by industrial and government agencies of the United Nations in establishing and maintaining standards for military matériel. A Quality Assurance Department, a novelty back in the nineteen-twenties, has come to be indispensable to almost every important manufacturer.

Scientific quality control is one of the many ideas of Bell Telephone Laboratories that have born fruit in the Bell System. The application of mathematics to production is helping good management all over the industrial world—and furthers the cause of good telephone service everywhere.

BELL TELEPHONE LABORATORIES

EXPLORING AND INVENTING, DEVISING AND PERFECTING FOR CONTINUED IMPROVEMENTS AND ECONOMIES IN TELEPHONE SERVICE

BIOLOGY

NATURE RAMBLINGS
by Frank Thone

Vegetable Ventilators

➤ DURING THE later months of World War II, new German submarines went into action with high hopes of eluding the ever-watchful eyes of Allied observers in planes, in blimps, on lofty lookout posts of ships. They did not need to come to the surface for weeks on end, because alongside the periscope was a tube through which air could be sucked down for their diesel engines and for the crew to breathe.

It was a most ingenious device, but after all not original. If you will cut through the stem of a waterlily, or a lotus, or almost any plant that grows with its roots under water you will find that it is not solid like the stems of most land plants. but that it has one or more holes in it. If you split the stem lengthwise you will find that these holes are long open channels. They lead down from leaves and flowers clear to the submerged roots.

The roots of a plant must have air, just as the leaves do. Without it they smother, just as a drowning man really dies of suffocation, because he cannot get air into his lungs.

Plants unlike animals do not have an elaborate system of lungs, respiratory muscles and blood corpuscles to carry oxygen supplies to the body's remotest tissues. Their oxygen supplies reach all their cells quite directly. That is one reason why leaves are a plant's most active organs—they are flat and thin, and oxygen from the air does not have to travel far to supply all their cells.

Although the roots of most common plants are underground, they can still get their oxygen. Enough air filters through the myriad crevices between soil particles to take care of that. That is, it does when the soil is in good tilth; if there is too much rain and flat fields are flooded too long most of the plants in them simply die of drowning.

Herbaceous plants like waterlilies and arrowleaf are not the only ones that have air-passages in their stems. Waterside shrubs like the buttonbush, and even great trees like the pond cypress, have breather systems. They differ in details of structure but they all serve the same function in the end.

The cypress uses a peculiar contrivance to get air to its roots. Every here and there a steeple-shaped structure projects up through the water where the trees stand. It is not hollow, like stems of some aquatic herbs, but is filled with a loose, sponge-like woody tissue, through which air can filter without too great difficulty.

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HERPETOLOGY

Black Widow Spiders Killed by Alligator Lizards

➤ ALLIGATOR LIZARDS, slender rough-scaled reptiles found in southern California, feed on black widow spiders and their eggs. Pleading for the life of the snake-like lizards, Dr. Raymond B. Cowles of the Los Angeles campus of the University of California says they could soon make the dread black widow spider a rarity as they can squeeze into cracks and crevices where the black widow spiders live.

Alligator lizards, that grow 12 to 16 inches in length, are harmless as far as humans are concerned. Unfortunately, the common house cat preys upon the lizards about as avidly as the lizard preys upon the spiders.

Science News Letter, June 15, 1946

• Books of the Week •

AEROBIC MESOPHILIC SPOREFORMING BACTERIA—Nathan R. Smith, Ruth E. Gordon, and Francis E. Clark—*Government Printing Office,* 112 p., tables, paper, 25 cents. U. S. Dept. of Agriculture, Miscellaneous Publication No. 559.

BIBLIOGRAPHY OF BIBLIOGRAPHIES ON THE ARCTIC—Rev. Artheme Dutilly—*Catholic Univ. of America,* 47 p., illus., paper, $1. Publication No. 1 B.

COLLEGE MATHEMATICS: A General Introduction—Charles H. Sisam—*Holt,* 561 p., tables and diagrs., $3.50. A textbook presenting the customary first-year course in college algebra, trigonometry, analytic geometry, and some calculus. Adapted to a three, four, or five-hour course for a year.

EXPLORING IN SCIENCE—Gerald S. Craig and Beatrice Davis Hurley—*Ginn,* 318 p., illus., $1.28. A natural science textbook for use in grade four. Includes chapters on astronomy, animals, plants, and a glossary of scientific terms. Book 4 in OUR WORLD OF SCIENCE series.

GUIDANCE PRACTICES AT WORK—Clifford E. Erickson and Marion C. Happ—*McGraw,* 325 p., $3.25. A description of specific practices carried on in schools as part of their guidance programs, including material drawn from many types and levels of education and from all parts of the country. Suggestions for checking guidance practices and pointers for those who wish to initiate or expand guidance programs.

INTERNATIONAL BUSINESS DICTIONARY—Frank Gaynor—*Philosophical Library,* 452 p., $6. The most frequently used commercial and banking terms and phrases given their equivalents in German, French, Spanish, and Italian. Cross indexes in German, French, Spanish, and Italian enable the user to translate from any of these languages into any of the others or into English.

MEDICAL SERVICES BY GOVERNMENT: Local, State, and Federal—Bernhard J. Stern—*Commonwealth Fund,* 208 p., tables, $1.50. A comprehensive summary of the complex and expanding field of government medical services, tracing the changing emphasis and changing points of view concerning the relative responsibilities of local community, the state government, and the Federal Government.

THE MEETING OF EAST AND WEST: An Inquiry Concerning World Understanding—F. S. C. Northrop—*Macmillan,* 531 p., illus., $6. An analysis of the ideological conflicts of the contemporary world and a suggestion for the resolution of these conflicts.

THE MODERN ATTACK ON TUBERCULOSIS—Henry D. Chadwick, M. D., and Alton S. Pope, M. D.—*Commonwealth Fund,* 134 p., tables, $1.00, rev. ed. A concise digest of the experience of many workers and of present day practices in controlling tuberculosis. This revised edition includes much new material about recent developments in administration and the techniques of control.

ON SIAMESE BIRDS—Rudolphe Meyer de Schauensee—*Academy of Natural Sciences of Philadelphia,* 82 p., paper, $2.45. Proceedings of The Academy of Natural Sciences of Philadelphia, Vol. XCVIII, 1946, pages 1-82.

POSTWAR ISSUES IN THE PETROLEUM INDUSTRY—Walter H. Voskuil—*Univ. of Illinois, Bureau of Economic and Business Research,* 32 p., tables, paper, free.

THE PROLONGATION OF LIFE—Dr. Alexander A. Bogomolets, translated by Peter V. Karpovich, M. D. and Sonia Bleeker—*Duell,* 93 p., $1.50. The factors involved in longevity, theories of aging, data about ACS (anti-reticular-cytotoxic) serum, told by the discoverer of ACS serum who is director of the Kiev Institute of Experimental Biology and Pathology. (For current evaluation of ACS serum, see SNL, April 27, 1946.)

THE RADIO AMATEUR'S HANDBOOK: The Standard Manual of Amateur Radio Communication—*American Radio Relay League,* 688 p., tables and illus., paper, $1.00, 23rd ed. The "bible" of radio hams.

REVISED LAPIDARY HANDBOOK—*J. Harry Howard,* 220 p., tables and illus., $3. Designed to provide practical instruction in gem cutting for the beginner and the advanced amateur. This book supersedes the author's HANDBOOK FOR THE AMATEUR LAPIDARY, and contains information about modern techniques.

SCIENCE ALL ABOUT US—Gerald S. Craig and Agnes Burke—*Ginn,* 160 p., illus., $1.04. A natural science textbook for use in the earliest grades. Many illustrations with simple facts about the seasons, weather, water, animals, etc. Book 1 in OUR WORLD OF SCIENCE series.

SKIN DISEASES, NUTRITION, AND METABOLISM—Erich Urbach, M. D.—*Grune and Stratton,* 634 p., tables and illus., $10. A comprehensive survey of the interrelationship between dermatology and internal medicine, with particular reference to the nutritional, biochemical, and metabolic aspects.

THERE'S WORK FOR ALL—Michael Young and Theodore Prager—*Duell,* 128 p., illus., $2.50. A survey by two British economists of the reasons why in peacetime there are fewer jobs than there are people who want jobs and why in wartime there are always more jobs than there are people to fill them.

UNDERSTANDING MICROWAVES — Victor J. Young—*Rider,* 385 p., diagrs., $6. The fundamental problems encountered in the field of ultra-high frequency research and production and how they are surmounted.

WHAT YOU DON'T KNOW MAY HURT YOU! —J. A. Rudolph, M. D. and Howard N. Rose—*Dorrance,* 138 p., illus., $1.50. A popular book about the various kinds of allergies, including many case histories.

WOMEN AND WORK—Gertrude Williams—*Duell,* 128 p., illus., $2.50. An attempt to disentangle the issues involved in deciding women's place in the field of employment now that the special wartime emergency is over.

WORKING WITH SCIENCE—Gerald S. Craig and Katherine E. Hill—*Ginn,* 384 p., illus., $1.36. A natural science textbook for use in the middle grades. Chapters on the nature of heat, the changing seasons, the growth of plants, the action of magnets, etc. Book 5 in OUR WORLD OF SCIENCE series.

Science News Letter, June 15, 1946

·New Machines And Gadgets·

❁ *SHOE HEEL, recently patented, consists of two parallel U-shaped metal springs connected at their open rear ends by crossbars. The upper shafts of the springs carry a plate to attach to the shoe. The heel is claimed to be resilient and comfortable to wear.*

Science News Letter, June 15, 1946

❁ *SPHERICAL ROLLER BEARING, a new thrust type, is claimed to combine the triple features of high-load capacity, speed and low temperature. The bearing's self-aligning principle compensates for any shaft deflections and permits heavy loads to be evenly distributed.*

Science News Letter, June 15, 1946

❁ *MAGNETIC LINKS placed in transmission systems record the current in lightning flashes from thunder clouds. If a streak of lightning passes through the system, the link is magnetized in proportion to the highest value of the current in the lightning bolt.*

Science News Letter, June 15, 1946

❁ *ELECTRIC CLOCKS of three types are available to waken a sleeper. One flashes a bedside lamp, a second turns on a radio program, and a third operates a buzzer that can be modulated in loudness. The first two have buzzers also; they sound soon after the light or radio is turned on.*

Science News Letter, June 15, 1946

❁ *PLASTIC WALL HOLDER, for one type of electric razor, automatically reels within itself the electric cord when the razor is put in it. When the razor is taken from the holder, shown in the picture, the electric current is automatically turned on; when the shaver is returned, the current is cut off, and the cord disappears.*

Science News Letter, June 15, 1946

❁ *FACSIMILE broadcasting equipment, that will print in the home by radio four standard letter-size pages of text, maps or photographs during a 15-minute broadcast, is but slightly larger than a portable typewriter. It may be attached to a radio set already in the home or built into a radio console by the manufacturer.*

Science News Letter, June 15, 1946

❁ *GARDEN HOE, a four-in-one tool, is a combined hoe, cultivator, rake and weed puller. It has the familiar hoe blade on one side; on the other are five broad-based, sharp-pointed teeth. Made of strong carbon steel, it is light in weight.*

Science News Letter, June 15, 1946

❁ *HOME FREEZER, of 240 pounds average capacity, is finished in enamel and stainless steel for installation in a modern kitchen. It maintains a temperature of zero Fahrenheit in all climates. Heat from the compressor is conducted to a defrosting tray to speed thawing out food when needed.*

Science News Letter, June 15, 1946

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin #15.*

BOOKS

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